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**GB 2375 597 A**

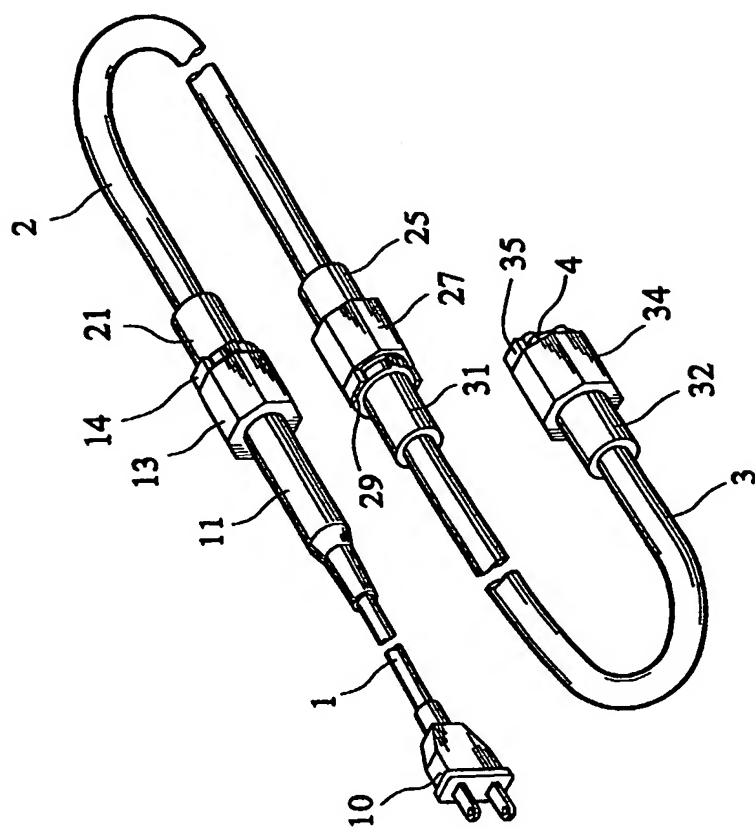
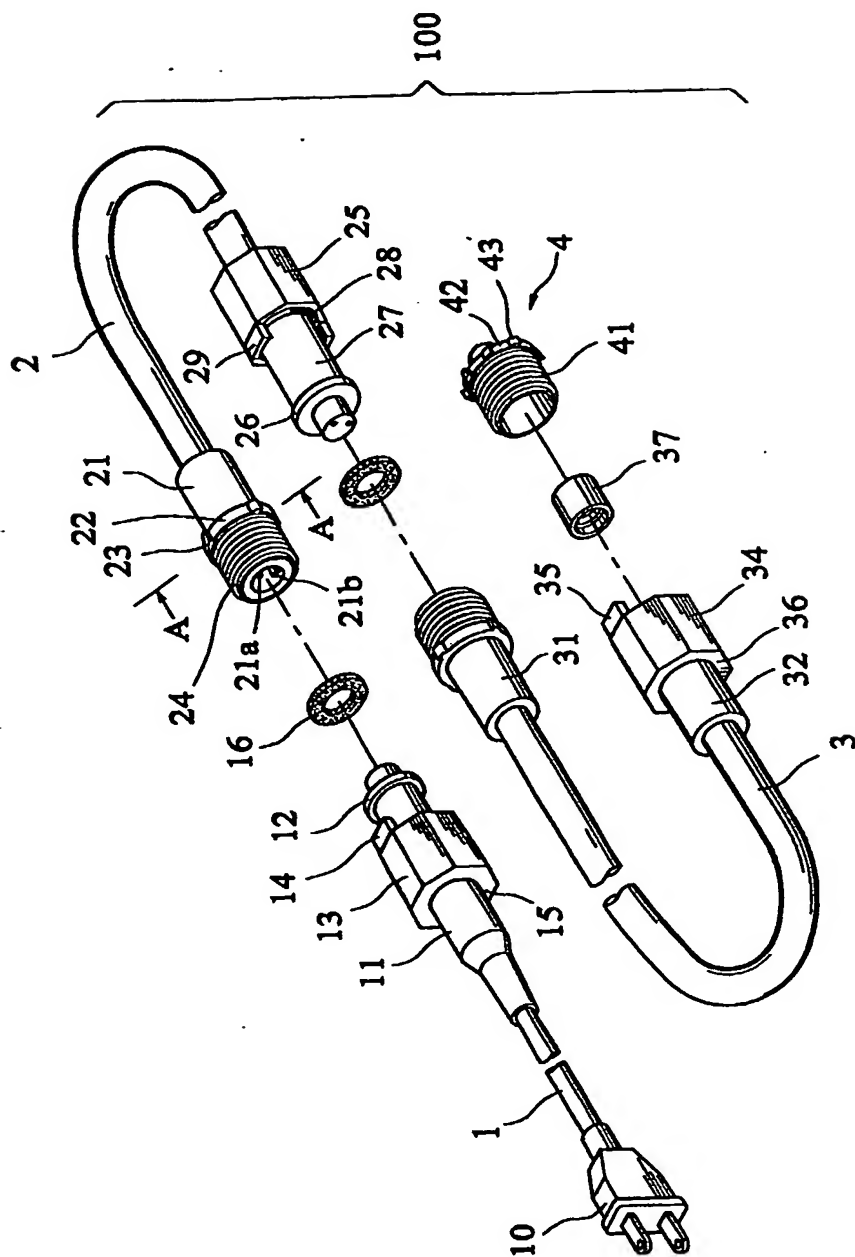


Fig. 1

1/4



**Fig. 2**

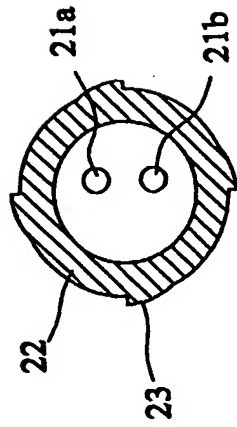


Fig. 3

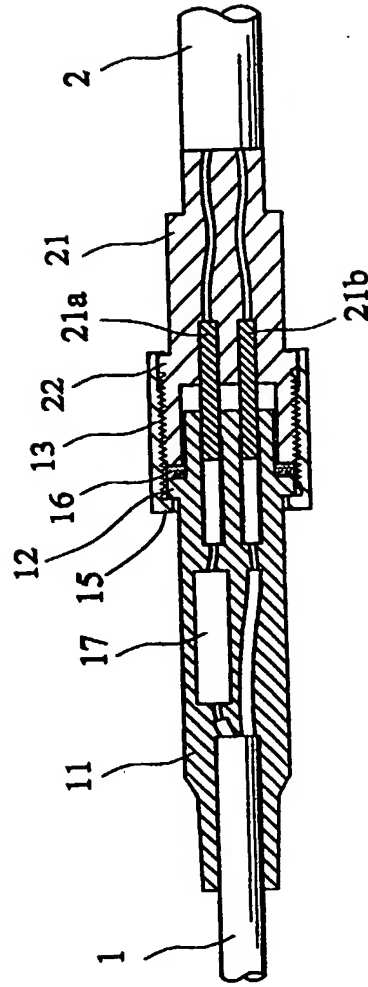


Fig. 4

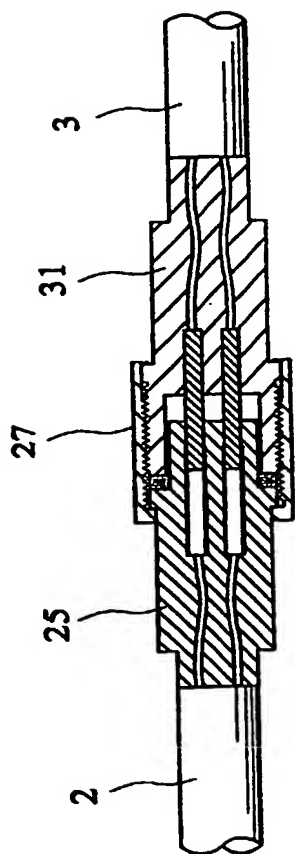


Fig. 5

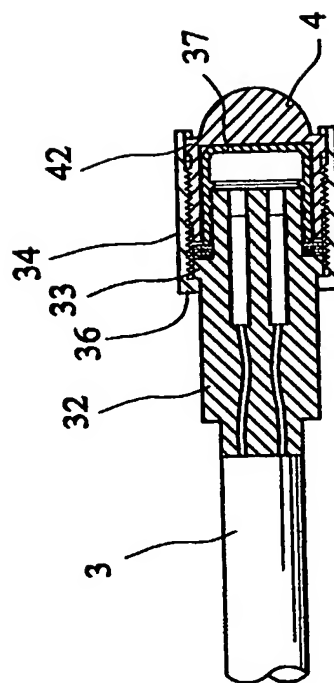


Fig. 6

## DECORATIVE ROPE LIGHT ASSEMBLY

### BACKGROUND OF THE INVENTION

#### 5 1. Field of the Invention

The present invention relates generally to a decorative light string, and more specifically to a decorative rope light assembly composed of a power line section, at least one light section, and an end light section connected by  
10 connectors.

#### 2. Description of the Prior Art

Decorative light strings are widely used in holidays and festivals. The  
15 conventional decorative light string usually is composed of a plurality of bulb sockets and an electrical wire for connecting the bulb sockets. Each of the bulb sockets may receive and hold a light bulb thereon. Typically, the light bulbs arranged on the light string are electrically connected in series to form a series circuit loop. An electric plug is provided at one end of the  
20 light string for connection with an external power source.

It is noted that the conventional decorative light string described above is not designed to have waterproof configuration, so that it is not suitable to be used in outdoors. Therefore, a known rope light string typically made of tubular waterproof material and formed with a hollow tube therein is  
25 developed. A plurality of light units are electrically connected in series and arranged inside the hollow tube of the light string in a manner equally spaced from each other.

The conventional rope light string mainly includes a power line section and a plurality of light sections connected by connectors therebetween to  
30 form an extended rope light string. However, it is noted that the structure of the connectors does not meet the electrical safe requirement.

Thus, it is desired to have an improved connector for the decorative rope light string that can be used outdoor safely for overcoming the problems

discussed above.

## SUMMARY OF THE INVENTION

5 Accordingly, a primary object of the present invention is to provide a decorative rope light assembly with improved connectors for connection of the light string.

Another object of the present invention is to provide a safe connector for the decorative rope light string, capable of configuring the rope light  
10 string safely and firmly.

To achieve the above objects, in accordance with the present invention, each of the light sections includes a first connector provided with a ring formed thereon and a plurality of pawls formed on the ring. A second end of the second connector is provided with a stop ring formed thereon and an  
15 inner thread formed at an open end of the second connector. A fastener has a front end provided with at least one protruded tongue and a rear end provided with an inward annular stopper. The fastener is movable along the second connector.

## BRIEF DESCRIPTION OF THE DRAWINGS

20 The present invention will be apparent to those skilled in the art by reading the following description of preferred embodiments thereof, with reference to the accompanying drawings, in which:

25 Figure 1 is a perspective view showing a rope light assembly constructed in accordance with a preferred embodiment of the present invention;

Figure 2 is an exploded view of the rope light assembly of the present invention;

30 Figure 3 is a cross-sectional view taken along line A-A of Figure 2;

Figure 4 is a cross-sectional view showing the power line section is connected with the light section of Figure 1;

Figure 5 is a cross-sectional view showing the light section is connected

with the end light section of Figure 1; and

Figure 6 is a cross-sectional view showing the end light section is connected with an end cap of Figure 1.

## 5 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference to the drawings and in particular to Figures 1 and 2, a decorative rope light assembly 100 in accordance with a preferred embodiment of the present invention is shown. The rope light assembly  
10 100 includes a power line section 1, at least one light section 2, and an end light section 3. A number of light sections with identical structure may be connected by connecting structure of the present invention to form an elongated decorative rope light string.

The power line section 1 has a first end connected with an electrical  
15 plug 10 and a second end mounted with a connector 11. The connector 11 is provided with a stop ring 12 formed thereon and an inner thread (not shown) formed at the open end of the connector 11.

A pair of conductive wires are spaced from each other and parallelly extended inside the power line section 1 from the electrical plug 10 to the  
20 end of the connector 11 for supplying electric power.

A fastener 13 is movable along the connector 11, formed with an inner thread therein. The front end of the fastener 13 is provided with a pair of protruded tongues 14. The rear end thereof is provided with an inward annular stopper 15 defining a central through hole with a diameter smaller  
25 than that of the stop ring 12. In a preferable embodiment, the fastener has a polygon outline with a tubular inner structure.

The light section 2 contains a plurality of light units electrically connected in series and arranged inside a transparent hollow tube of the light section for decoration.

30 One end of the light section 2 is fixed with a first connector 21 which is provided with a ring 22 formed thereon. A plurality of pawls 23 equally spaced each other are further formed on the ring 22. An outer thread section 24 is protruded at an open end of the first connector 21. A pair of



conductive wires 21a and 21b are spaced from each other and parallelly extended inside the first connector 21, as shown in Figure 3.

The other end 25 of the light section 2 is fixed with a second connector 25. The second connector 25 includes a stop ring 26, a fastener 27, an inner thread 28, and a pair of protruded tongues 29. That is, the structure of the second connector 25 is exactly same to that of the connector 11 of the power line section 1 described above. The fastener 27 is movable along the second connector 25.

When connecting the power line section 1 and the light section 2, the inner thread of the fastener 13 is threaded onto the outer threads 24 formed on the first connector 21 of the light section 2. Preferably, a waterproof ring 16 is further inserted between the connector 11 of the power line section 1 and the connector 21 of the light section 2.

After assembled, with reference to Figure 4, the inward annular stopper 15 of the fastener 13 is stopped against the ring 12 of the connector 11, and the protruded tongue 14 are limited by the pawls 23. By means of the protruded tongues 14 and the corresponding pawls 23, it can limit the fastener 13 from being rotated in a reversed direction, thereby securely connecting the power light section 1 and the light section 2 together.

A fuse 25 is retained in the connector 11 of the power line section 1 and electrically connected to one of the conductive wires in series for over-current protection, as shown in Figure 4.

The end light section 3 has a first connector 31 and a second connector 32. The first connector 31 can connect to the second connector 25 of the light section 2 by means of the fastener 27, with reference to Figure 5. The structure of the end light section 3 is exactly same to that of the light section 2. That is, the second connector 32 also includes a stop ring 33, a fastener 34, and a pair of protruded tongues 35, and an inward annular stopper 36.

A waterproof cap 37 may be mounted onto the open end of the second connector 32 of the end light section 3, with reference to Figure 6. Then, an end cap 4 may be mounted onto the connector 32 by means of the fastener 34. The end cap 4 is provided with an outer thread 41 and a ring 42 with a number of pawls 43 thereon.

Although the present invention has been described with respect to the preferred embodiments, it is contemplated that a variety of modifications, variations and substitutions may be done without departing from the scope of the present invention that is intended to be defined by the appended claims.

**I claim:**

1. A decorative rope light assembly having a plurality of light sections, each of the light sections comprising:
  - 5 a hollow tube having a first end and a second;
  - a first connector fixed at the first end of the hollow tube, provided with a ring formed thereon and an outer thread protruded at an open end of the first connector, a plurality of pawls equally spaced each other being further formed on the ring;
  - 10 a second connector fixed at the second end of the hollow tube, provided with a stop ring formed thereon and an inner thread formed at an open end of the second connector; and
  - a fastener with an inner thread, having a front end provided with at least one protruded tongue and a rear end provided with an inward annular stopper, the fastener being movable along the second connector.
  - 15
2. The decorative rope light assembly as claimed in claim 1, wherein the fastener has a polygon outline with a tubular inner structure.
- 20 3. A decorative rope light assembly comprising:
  - a power line section comprising:  - a first end connected with an electrical plug;
  - a second end mounted with a connector, the connector being provided with a stop ring formed thereon and an inner thread formed at an open end of the connector; and
  - 25 a fastener with an inner thread, having a front end provided with at least one protruded tongue and a rear end provided with an inward annular stopper, the fastener being movable along the connector of the power line section;
  - 30 at least one light section, each of which comprising:  - a hollow tube having a first end and a second;
  - a first connector fixed at the first end of the hollow tube, provided with a ring formed thereon and an outer thread protruded at an open end of the

first connector, a plurality of pawls equally spaced each other being further formed on the ring, the first connector being connected to the connector of the power line section by the fastener of the power line section;

5 a second connector fixed at the second end of the hollow tube, provided with a stop ring formed thereon and an inner thread formed at an open end of the second connector of the light section; and

a fastener with an inner thread, having a front end provided with at least one protruded tongue and a rear end provided with an inward annular stopper, the fastener being movable along the second connector of the  
10 light section;

an end light section, comprising:

a hollow tube having a first end and a second;

a first connector fixed at the first end of the hollow tube, provided with a  
15 ring formed thereon and an outer thread protruded at an open end of the first connector, a plurality of pawls equally spaced each other being further formed on the ring, the first connector being connected to the connector of the light section by the fastener of the light section;

a second connector fixed at the second end of the hollow tube, provided  
20 with a stop ring formed thereon and an inner thread formed at an open end of the second connector of the end light section; and

a fastener with an inner thread, having a front end provided with at least one protruded tongue and a rear end provided with an inward annular stopper, the fastener being movable along the second connector of the  
25 end light section; and

an end cap provided with an outer thread and a ring with a number of pawls thereon, mounted onto the second connector of the end light section by means of the fastener of the end light section.

30 4. The decorative rope light assembly as claimed in claim 3, wherein the fastener has a polygon outline with a tubular inner structure.

5. The decorative rope light assembly as claimed in claim 3, further

comprising a waterproof cap mounted onto the second connector of the end light section, and then mounted with the end cap.

5 6. The decorative rope light assembly as claimed in claim 3, wherein the power line section further comprises a fuse retained in the connector of the power line section.

7. A decorative rope light assembly substantially as herein-  
before described with reference to and as shown in the  
accompanying drawings.



Application No: GB 0111832.2  
Claims searched: 1-7

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Date of search: 31 July 2002

## Patents Act 1977 Search Report under Section 17

### Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.T): F4R (RS, RPR, RL, RCM, RR)

Int CI (Ed.7): F21S 4/00; F21V 21/005; F21V 23/06; F21V31/00

Other: Online: WPI, EPODOC, PAJ

### Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A, E	EP 1122490 A1 (SHINING BLICK) see figs and abstract	-
A, E	US 6340233 B1 (SHIEH) see figs and abstract	-
A	US 5964518 A (SHEN) see figs and abstract	-

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E Patent document published on or after, but with priority date earlier than, the filing date of this application.